

AMENDMENTS TO THE CLAIMS

1. (Currently amended) A plasma source apparatus comprising:

a substrate having a first surface and an opposing surface;

a second surface, said second surface being spaced apart from said first surface by a predetermined gap, connected to a power supply as a cathode;

a third surface connected to the power supply as an anode;

a magnetic field source comprising a permanent magnetic oriented with a north pole proximal to said substrate relative to a south pole and providing a magnetic field axial with said magnetic field source, said magnetic field passing into both said first and second surfaces and through said gap, said magnetic field having a portion passing through said substrate that is at least two times stronger at said first surface than at said second surface, said magnetic field portion having a strength strong enough to magnetize electrons; and

an electric field extending to said second surface and said electric field penetrating into an electron confining region of said magnetic field to confine the electrons electrostatically and with mirror magnetic confinement.

2. (Previously presented) A plasma source apparatus in accordance with claim 1, wherein:

said electric field extends to said substrate.

3. (Previously presented) A plasma source apparatus in accordance with claim 1, comprising:

a chamber, said chamber containing said first and second surfaces; and

said electric field extends from said chamber to said substrate.

4. (Previously presented) A plasma source apparatus in accordance with claim 1, comprising:

said substrate moving continuously relative to said magnetic field.

5. (Currently amended) A plasma source apparatus in accordance with claim 1, wherein:

said substrate has said first surface parallel to said opposing surface.

6. (Withdrawn) A plasma source apparatus in accordance with claim 1, wherein:
said substrate is biased positively.

7. (Withdrawn) A plasma source apparatus in accordance with claim 1, wherein:
said substrate is tied to ground.

8. (Withdrawn) A plasma source apparatus in accordance with claim 1, wherein:
said substrate is left floating.

9. (Previously presented) A plasma source apparatus in accordance with claim 1, wherein:
said substrate is biased negatively.

10. (Previously presented) A plasma source apparatus in accordance with claim 1,
wherein:

said substrate is biased with an AC voltage.

11. (Previously presented) A plasma source apparatus in accordance with claim 1,
wherein:

said first and second surfaces are parallel.

12. (Withdrawn) A plasma source apparatus in accordance with claim 1, wherein:

said first and second surfaces are non-parallel.

13. (Previously presented) A plasma source apparatus in accordance with claim 1,
wherein:

said substrate comprises a flexible web supported by a conveyor roll.

14. (Previously presented) A plasma source apparatus in accordance with claim 1,
comprising:

a mirror field shaped into a racetrack and having a return field passing through the center
of the racetrack.

15-20 (Canceled)

21. (Currently amended) A plasma source apparatus comprising:

a substrate having a first surface and an opposing surface;

a second surface, said second surface being spaced apart from said first surface by a predetermined gap, connected to a power supply as a cathode;

a third surface connected to the power supply as an anode;

a permanent magnet oriented with a north pole proximal to said substrate relative to a south pole and under said substrate providing a magnetic field axial with said permanent magnet under said substrate, said magnetic field passing into both said first and second surfaces and through said gap, said magnetic field having a portion passing through said substrate that is at least two times stronger at said first surface than at said second surface, said magnetic field portion having a strength strong enough to magnetize electrons; and

an electric field extending to said second surface and said electric field penetrating into an electron confining region of said magnetic field to confine the electrons electrostatically and with mirror magnetic confinement.

22. (Previously presented) A plasma source apparatus in accordance with claim 21, wherein:

said electric field extends to said substrate.

23. (Previously presented) A plasma source apparatus in accordance with claim 21, comprising:

a chamber, said chamber containing said first and second surfaces; and

said electric field extends from said chamber to said substrate.

24. (Previously presented) A plasma source apparatus in accordance with claim 21, comprising:

relative movement between said substrate moving continuously relative to said magnetic field.

25. (Previously presented) A plasma source apparatus in accordance with claim 21, wherein:

said substrate is biased negatively.

26. (Previously presented) A plasma source apparatus in accordance with claim 21, wherein:

said substrate is biased with an AC voltage.

27. (Previously presented) A plasma source apparatus in accordance with claim 21, wherein:

said first and second surfaces are parallel.

28. (Previously presented) A plasma source apparatus in accordance with claim 21, wherein:

said substrate comprises a flexible web supported by a conveyor roll.

29. (Previously presented) A plasma source apparatus in accordance with claim 21, comprising:

a mirror field shaped into a racetrack and having a return field passing through the center of the racetrack.